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17 JAN 1957

MEMORANDUM FOR: Contracting Officer

SUBJECT : Frequency Correction for A and C Racks

1. It has come to my attention that the reproducing system used in racks A and C drops off rapidly below 200 cycles and very rapidly below 120 cycles, and varies considerably throughout the remainder of their frequency range. In our conversations of the fidelity requirements for these systems, it was requested that you provide 50-60,000 cycle band pass systems. An earlier request for 20-60,000 was reduced to 50-60,000 at your suggestion. At this time, you indicated that 75,000 was easily reached as an upper limit and I spoke of the usefulness of such a range. It is required that a 50-60,000 essentially flat response be retained so that the results of System 1, 4 and 5 can be fully interpreted. The present low frequency roll-off will result in a serious loss of intercept data.

2. In addition, it will be a considerable chore to interpret the data unless this band-pass is essentially flat. Since a duplicate will have been run through two systems before interpretation and unless one can say the total amplitude degradation is neglectible one will need make correction for each operation in order to retain useable power level data. The Ampex equipment that we have used in the past has met this requirement. A typical Ampex recorder and playback system response is ± 2 db from 20 cycles to an upper frequency set by the tape speed. Since we usually analyze from 50 cycles to an upper limit of 4000 cycles, the Ampex equipment is much better than ± 2 db. Typically we get better than ± 1 db in this range and after two operations (a dupe and playback) still have amplitude data retained within ± 1 or at most ± 2 db.

3. It is perhaps worth mentioning as background information that we have no use for the pulse shape as recorded by any tape recorder since all collection systems degrades this data. Rather we work with the magnitude of the fundamental component of the pulse as a measure of the magnitude of the original power. For this reason, it is most significant to retain in so far as possible the amplitude of the fundamental.

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4. It is requested that the A and C racks be frequency corrected so that they are as good as Ampex equipment in the range of 50 to 4000 cycles. It is further requested that the 50 to 60,000 cycle requirement be met so that high speed duping and analysis work up to 60,000 cycles, which is occasionally required, can be carried out satisfactorily. The 75,000 cycle upper limit that you suggested would be desirable.

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